CLIMATE CHANGE DATA ANALYSIS
IS SPRING WEATHER COMING EARLIER EACH YEAR?

Content Standard & Performance Indicator	1 Attempted Demonstration (little evidence)	2 Partial Demonstration (some evidence)	3 Proficient Demonstration (evidence meets std)	4 Sophisticated Demonstration (exceeds standard)
GATHERING DATA & USING GRAPHS: **ELA H-1and 7** Gather, evaluate and synthesize data to communicate knowledge **S/T L-4** Make & use graphs to describe relationships **Math G-4** Describe and represent relationships with graphs to make generalizations about phenomena.	Student attempts to obtain data, creates or uses one graph. Does not attempt to describe relationships between graphs.	Student creates two graphs accurately and attempts to describe graph relationships.	Student obtains data and creates* and uses at least <u>two</u> graphs of ice out data and <u>one</u> graph of average spring temp data to address the Scientific Q: **Is Spring Weather Coming Earlier?** • * If teacher has opted for student created graphs; includes <u>two</u> scatter graphs of ice out data and <u>one</u> scatter graph of average spring temp data, with appropriate titles, headings, labels, and trend lines (or equations).	Student creates four or more graphs from available data and successfully describes relationships between all graphs created and how that might improve data validation.
ANALYZING DATA: **ELA E-3** Asks questions and applies personal interpretation **MATH C-3** Constructs inferences & arguments **S/T K-2** Formulates Ideas **S/T J-2** Verify & evaluate scientific investigations and use results in a purposeful way	Student poses one idea about graphs but does not compare and contrast data.	Student attempts to compare and contrast graphs and data. Student attempts to pose at least one interpretive idea and attempts to describe supportive evidence.	• Student compares and contrasts graphed data. Describes at least <u>three</u> observations or inferences from graphs and describes relationships between those observations. Provides supporting evidence. • Describes how trend lines might be interpreted as an ecological indicator of earlier springs overall.	Student provides three to five additional ideas with evidence to support each inference. and/or Student finds and describes additional scientific opinions/studies that support the students' observations about relationships between graphs.

REFLECTION & SYNTHESIS: (critical thinking) **ELA E-3** Asks questions and applies personal interpretation **MATH C-3** Identify other parameters that might help expand upon the student ideas or inferences **S/T K-6** Support reasoning by using a variety of evidence	Student identifies one question or one additional indicator, but does not provide supporting evidence or how it would be useful.	Student identifies one additional indicator of spring and attempts to provide supporting evidence on how it might relate to ice out and temperature data. Student identifies one new climate related question they could investigate.	• Student reflects on what has been discovered, and then identifies at least <u>two</u> additional indicators of spring that might relate to the ice out and temperature data. • Student provides a clear description of at least <u>one</u> new question they would investigate if he or she was a climate scientist, and how it would be useful.	Student goes beyond expectations with additional questions for research and identifies sources of such data by conducting additional research. OR Student validates their investigations in some way, using new sources of data.
REPORT WRITING: **ELA G-4** Write essays which identify a clear topic and reliably support that topic **MATH G-1** Describe relationships and make generalizations **S/T L-1** Present (discuss) scientific ideas and make conjectures and convincing arguments.	Student attempts to write a report and identifies the topic but is unable to explain data analysis clearly or to provide supportive evidence and create personal inferences. There are many mistakes in grammar, spelling or punctuation.	Student writes a report with clearly identified topic and explains sources of data and findings, but is weak on describing supportive evidence. Student attempts to recommend other sources of data but is unable to clearly relate how that might be useful. Students work is neat, but could have been better organized and edited. There are some mistakes in grammar, spelling or punctuation.	• Student clearly identifies topic in introduction. • Student expands description of topic and explains sources of data used. • Student compares and contrasts data, includes at least <u>two other</u> indicators of spring and recommends at least <u>one</u> additional research question to explore. • Student summarizes conclusions. • Student's report is 500 words or less, typed, and is clearly organized. Paragraphs are well constructed, and there are no major grammatical errors, misspelled words or incorrect punctuation.	The essay is written in a creative manner.